UNITED STATES PATENT AND TRADEMARK OFFICE

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09/658,538	09/09/2000	Paul Robert Williams	11336/190	3472

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _06 October 2008_.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _51-81 and 89-94_ is/are pending in the application.
    4a) Of the above claim(s) _51-62,78 and 93_ is/are withdrawn from consideration.
5) ☒ Claim(s) _79-81 and 89-92_ is/are allowed.
6) ☒ Claim(s) _63,64,66-72,74,76,77 and 94_ is/are rejected.
7) ☒ Claim(s) _65,73 and 75_ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _09 September 2000_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some * c) ☐ None of:
        1. ☐ Certified copies of the priority documents have been received.
        2. ☐ Certified copies of the priority documents have been received in Application No. _____.
        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   **Claims 63, 64, 66-68, 71, and 94** are rejected under 35 U.S.C. 102(b) as being

clearly anticipated by Lewis et al., US 5,245,665 A (previously presented in an IDS

received 01/16/01 and hereinafter Lewis).

3.   Regarding **claim 63**, Lewis teaches a method of reducing acoustic feedback in a

system comprising:

> *sequentially converting a buffered acoustic signal to a plurality of sequential frames in a frequency domain, each frame comprising an array of frequency magnitude bins* (see column 9, lines 24-39);
> *comparing an old value of a first frequency magnitude bin that is included in a first frame of the sequential frames with a new value of the first frequency magnitude bin that is included in a second frame of the sequential frames* (see column 9, line 40 - column 10, line 4, wherein the example of using five positions for each of three frequencies allow the comparison of old values with new values at a first frequency across adjacent frames);
> *in response to the new value being greater than the old value, adjusting the old value based on the new value and a filter coefficient* (see column 10, lines 4-25, wherein the old magnitude value is adjusted with a notch filter in step 282 and the notch filter inherently has filter coefficients defining its width);
> *identifying the first frequency magnitude bin as a candidate frequency in response to the adjusted old value exceeding a threshold value* (see column 10, lines 21-25, wherein the adjusted old value is still above a threshold, the depth N is increased); *and*
> *testing for a predetermined amount of reduction in a measured amplitude at the candidate frequency by application of a notch filter to the candidate frequency* (see column 9, line 10 - column 10, line 34 and figures 14 and 15, wherein the program loops and tests for a predetermined amount of reduction set at least by the value M).

4.   Regarding **claim 64**, see the preceding argument with respect to claim 63. Lewis

teaches the method of claim 63 where

adjusting the old value comprises calculating the filter coefficient based on a determined time value to reach the threshold value (see column 9, line 60 - column 10, line 25, wherein the threshold is set by at least "P" and an elapsed time to fill "P" positions in the "revolving candidate buffer").

5.   Regarding **claim 66**, see the preceding argument with respect to claim 63. Lewis teaches the method of claim 63 with these features (see column 10, lines 4-21, wherein the notch filter frequency is set to the new feedback frequency, which is inherently associated with the amplitude and frequency magnitude bin number in the Fourier transform)

6.   Regarding **claim 67**, see the preceding argument with respect to claim 63. Lewis teaches the method of claim 63 with these features (see column 9, line 57- column 10, line 25, wherein an absolute threshold is taught by the value M and a relative threshold is taught by the value P).

7.   Regarding **claim 68**, see the preceding argument with respect to claim 67. Lewis teaches the method of claim 63 with these features (see column 9, line 57- column 10, line 25, wherein an example teaches that a candidate frequency becomes discontinued after it is not identified for at least 3 out of 5 successive FFT frames).

8.   Regarding **claim 71**, see the preceding argument with respect to claim 63. Lewis teaches the method of claim 63 with these features. Lewis teaches setting the depth to N, which is preferably 3dB or less (column 10, lines 4-25). Lewis also teaches a bandwidth for a notch filter (column 12, lines 1-12).

9.   Regarding **claim 94**, see the preceding argument with respect to claim 63. Lewis teaches the method of claim 63 with these features.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

11.   **Claims 69, 70, and 72** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lewis as applied to claim 63 above, and further in view of Bernstein,

US 5,912,880 A.

12.   Regarding **claim 69**, see the preceding argument with respect to claim 63. Lewis

teaches a method of claim 63. Lewis teaches a program by virtue of a flowchart (see

figures 14 and 15), but does not specifically teach a state machine.

Bernstein teaches a control circuit can be represented by a state machine (see

figure 5, and column 4, lines 15-18). Lewis teaches a program, which must include

circuitry to decide when to perform the steps outlined in at least the flowcharts of figures

14 and 15. Therefore the flowchart taught by Lewis can be physically instantiated by

state machines. It would have been obvious for one of ordinary skill in the art at the

time of the invention to combine the teachings of Lewis and Bernstein for the purpose of

creating a physical instantiation of the filtering algorithm.

13.   Regarding **claim 70**, see the preceding argument with respect to claim 69. The

combination of Lewis and Bernstein teaches the use of state machines for performing

several functions embodied in flowcharts (see Bernstein, figure 5 and compare to Lewis,

figure 15, steps 274, 276, 278, 280, 282, and 284). It would have been obvious for one

of ordinary skill in the art at the time of the invention to use state machines to perform

the logical decisions of freeing a filter, setting up a new filter, or increasing the depth of

an old filter for a plurality of filters (see Lewis, column 10, lines 4-8).

14.   Regarding **claim 72**, see the preceding argument with respect to claims 63 and

69. The combination teaches that a state machine can perform tracking the status (see

Lewis, figure 15, step 276).

15.   **Claims 74, 76, and 77** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lewis.

16.   Regarding **claim 74**, see the preceding argument with respect to claim 71. Lewis

teaches the method of claim 63 wherein it is obvious that the initial predetermined

amount is 3db (see Lewis, column 10, lines 13-18, wherein Lewis contemplates a range

between 1 to 6 db, preferably 3dB or less). It would have been obvious for one of

ordinary skill in the art at the time of the invention to set N to 3dB for the purpose of

creating the best fidelity. One of ordinary skill can appreciate that the depth of the filter

should be as shallow as possible, so as to only eliminate the feedback and not disrupt

the audio content too much.

17.   Regarding **claim 76**, see the preceding argument with respect to claim 74.

Lewis teaches the method of claim 63, and makes obvious the method of claim 74. By

extension of the argument with respect to claim 74, it is obvious to first set the filter to a

depth of N=3dB and to increase it by N for a final depth of 6dB (see Lewis, column 10,

lines 13-25).

18.   Regarding **claim 77**, see the preceding argument with respect to claims 63 and

76. Lewis teaches the method of claim 76 with these features (see figure 15, steps 274

and 282).

Allowable Subject Matter

19.   **Claims 65, 73, 75** are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

20.   **Claims 79-81 and 89-92** are allowed.

21.   The following is a statement of reasons for the indication of allowable subject

matter:

22.   Regarding **claim 79**, the prior art does not appear to teach or reasonably suggest

setting a notch filter to a depth of 0dB (i.e. a flat response) when a feedback candidate

frequency cannot be reduced by a determined value. Lewis appears to teach freeing

notch filters only when stronger feedback signals are detected.

23.   **Claims 80 and 81** are allowable because they depend from claim 79.

24.   Regarding **claim 89**, the prior art does not appear to teach or reasonably suggest

creating a time limit in a state machine for testing a feedback candidate frequency.

25.   **Claims 90 and 91** are allowable because they depend from claim 89.

Conclusion

26.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

27.   Miller et al., US 5,506,910 A, teaches an automatic equalizer with notch filters

(see column 8, line 65 - column 11, line 56 and figures 7 and 8).

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to DANIEL R. SELLERS whose telephone number is

(571)272-7528. The examiner can normally be reached on Tuesday to Friday, 8am to

6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Curtis Kuntz can be reached on (571)272-7499. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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published applications may be obtained from either Private PAIR or Public PAIR.

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel R. Sellers/
Examiner, Art Unit 2614
/CURTIS KUNTZ/

Supervisory Patent Examiner, Art Unit 2614